

CLAIMS

1. An electrical apparatus comprising electrical components and a monitoring device of
5 at least one of said electrical components,
said monitoring device comprising electromagnetic receiving means connected to at least
one sensor, said electromagnetic receiving means being designed to receive an
electromagnetic radiation from electromagnetic emitting means.

10 2. The electrical apparatus according to claim 1, wherein the monitoring device
comprises load variation means connected to the electromagnetic receiving means to send a
monitoring signal by modifying the electromagnetic radiation when an electromagnetic
radiation is received.

15 3. The electrical apparatus according to claim 1, wherein the electromagnetic receiving
means supply electrical power when they receive an electromagnetic radiation.

4. The electrical apparatus according to claim 1, wherein the monitoring device
comprises at least one display device designed to be supplied by the electromagnetic
20 receiving means to display the state of at least one sensor when an electromagnetic
radiation is received by said electromagnetic receiving means.

5. The electrical apparatus according to claim 1, wherein the electromagnetic receiving means comprise at least one electromagnetic induction coil.

6. The electrical apparatus according to claim 1, wherein the electromagnetic receiving means comprise at least one antenna.

7. The electrical apparatus according to claim 1, wherein the electromagnetic receiving means comprise a circuit tuned to a frequency appreciably equal to a frequency of the electromagnetic radiation.

8. The electrical apparatus according to claim 1, wherein the electromagnetic receiving means are arranged in at least one side wall of the electrical apparatus.

9. The electrical apparatus according to claim 1, wherein the electromagnetic receiving means are arranged on a back-plate of the electrical apparatus and are able to be directed towards a support comprising means for emitting an electromagnetic radiation.

10. The electrical apparatus according to claim 1, comprising an electrical switch and a sensor supplying a signal representative of the state of said switch to the monitoring device.

11. The electrical apparatus according to claim 1, comprising an electrical circuit breaker and a sensor supplying a signal representative of the state of said circuit breaker to the monitoring device.

5 12. The electrical apparatus according to claim 1, comprising a device for detecting the presence of electrical voltage supplying a signal representative of a voltage presence to the monitoring device.

10 13. The electrical apparatus according to claim 1, wherein the monitoring device comprises an input circuit connected to the electromagnetic receiving means and an encoding circuit connected to said input circuit.

15 14. The electrical apparatus according to claim 13, wherein the input circuit comprises means for supplying an electrical power supply when an electromagnetic radiation is received.

15 15. The electrical apparatus according to claim 13, wherein the input circuit comprises means for supplying a signal representative of a clock signal when an electromagnetic radiation is received.

20 16. The electrical apparatus according to claim 13, wherein the input circuit comprises means for varying a load impedance of the electromagnetic receiving means, the load impedance variation enabling an electromagnetic radiation received by said receiving

means to be modified and a signal to be sent back to means for emitting said electro-magnetic radiation.

17. The electrical apparatus according to claim 13, wherein the encoding circuit
5 comprises at least one input to receive a signal representative of a monitoring signal and at least one output for supplying a signal representative of a command.

18. The electrical apparatus according to claim 13, wherein the monitoring device
10 comprises identification means to supply a monitoring signal representative of identification or setting parameters of the electrical apparatus to the encoding circuit.

19. The electrical apparatus according to claim 18, wherein the identification means
comprise storage means to store a unique identification number for each apparatus.

20. The electrical apparatus according to claim 13, wherein the monitoring device
15 comprises means for determining the state of at least one sensor of the electrical apparatus to supply a monitoring signal representative of the state of said at least one sensor to the encoding circuit.

21. The electrical apparatus according to claim 13, wherein the monitoring device
20 comprises means for measuring at least one electrical quantity to supply a monitoring signal representative of said at least one electrical quantity to the encoding circuit.

22. The electrical apparatus according to claim 13, wherein the monitoring device comprises means for measuring at least one magnetic quantity to supply a monitoring signal representative of said at least one magnetic quantity to the encoding circuit.

5 23. The electrical apparatus according to claim 13, wherein the monitoring device comprises means for measuring at least one thermal quantity to supply a monitoring signal representative of said at least one thermal quantity to the encoding circuit.

10 24. The electrical apparatus according to claim 13, wherein the monitoring device comprises display means receiving a signal representative of a display command from the encoding circuit.

15 25. The electrical apparatus according to claim 13, wherein the monitoring device comprises actuating means receiving a signal representative of a command of the electrical apparatus from the encoding circuit.

26. The electrical apparatus according to claim 13, wherein the monitoring device comprises communication means to send signals to or receive signals from the encoding circuit.

20 27. The electrical apparatus according to claim 13, wherein the monitoring device comprises electromagnetic emitting means arranged in the apparatus to send signals from the encoding circuit.

28. The electrical apparatus according to claim 13, wherein the encoding circuit comprises anticollision processing means to manage emission and/or receipt of communication frames.

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29. The electrical apparatus according to claim 13, wherein the encoding circuit comprises means for transmitting a preset number of identical communication frames.

30. The electrical apparatus according to claim 13, wherein the monitoring device
10 comprises initialization means connected to the input circuit and to the encoding circuit.

31. The electrical apparatus according to claim 1, wherein the apparatus is arranged in a modular electrical switchgear case.

32. An electrical switchgear support in the form of a rail comprising electromagnetic
15 emitting means designed to emit an electromagnetic radiation to at least one electrical apparatus according to any one of the claims 1 to 31 comprising electromagnetic receiving means.

33. The support according to claim 32, wherein the electromagnetic emitting means
20 comprise at least one induction loop arranged on a front face of said support.

34. The support according to claim 32, wherein the electromagnetic emitting means comprise at least one induction coil with several turns arranged on a front face of the support.

5 **35.** The support according to claim 32, comprising a body made of magnetic material to concentrate magnetic field lines.

36. The support according to claim 32, wherein the rail is a symmetrical rail having a hollow part on the front face comprising at least one electromagnetic induction coil.

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37. The support according to claim 36, wherein the electromagnetic induction coil has a central part without magnetic material.

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38. The support according to claim 36, wherein the electromagnetic induction coil has a central part with a core made of magnetic material.

39. An electrical switchgear monitoring device comprising electromagnetic emitting means designed to emit an electromagnetic radiation to at least one electrical apparatus according to one of the claims 1 to 31 comprising electromagnetic receiving means.

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40. The device according to claim 39, comprising means for generating a high frequency signal connected to the electromagnetic emitting means.

41. The device according to claim 39, comprising a processing circuit comprising means for modulating, demodulating, encoding and/or decoding a signal representative of an electromagnetic radiation able to be emitted by the electromagnetic emitting means.

5 42. The device according to claim 41, wherein the processing circuit comprises means for detecting the variation of the electromagnetic radiation emitted by the electromagnetic emitting means and able to be modified by a monitoring device of at least one apparatus.

10 43. The device according to claim 41, comprising display means connected to the processing circuit.

44. The device according to claim 41, comprising means for communicating with a remote centralizer.

15 45. The device according to claim 41, comprising a centralizer connected to the processing circuit.

20 46. The device according to claim 45, wherein the centralizer comprises electrical installation monitoring means designed to receive at least one identification number of at least one apparatus to monitor display of characteristics of said at least one apparatus.

47. The device according to claim 39, comprising an enclosure having at least one side wall comprising the electromagnetic emitting means.

48. The device according to claim 39, wherein the electromagnetic emitting means
comprise at least two electromagnetic induction coils on two walls arranged on opposite
sides of an enclosure with respect to the arrangement of at least one electrical apparatus
5 able to be arranged in said enclosure.

49. The device according to claim 39, wherein the electromagnetic emitting means
comprise at least one electromagnetic induction coil of elongate shape arranged parallel to
at least one support in the form of a rail designed to receive an electrical apparatus
10 comprising electromagnetic receiving means.

50. The device according to claim 39, wherein the electromagnetic emitting means
comprise at least two serially connected electromagnetic induction coils connected to the
means for generating a high frequency signal.

51. The device according to claim 39, wherein the electromagnetic emitting means
comprise at least two electromagnetic induction coils individually connected to means for
generating a high frequency signal.

52. The device according to claim 39, comprising at least one support according to any
one of the claims 32 to 38 comprising electromagnetic emitting means.

53. The device according to claim 39, comprising at least one apparatus according to any one of the claims 1 to 31 comprising electromagnetic receiving means.

54. An electrical installation comprising electrical apparatuses connected to an electrical power system and comprising at least one electrical apparatus according to any one of the claims 1 to 31 comprising electromagnetic receiving means.

55. An electrical installation comprising electrical apparatuses connected to an electrical power system and comprising at least one support comprising electromagnetic receiving means to support at least one electrical apparatus according to any one of the claims 32 to 38.

56. An electrical installation comprising electrical apparatuses connected to an electrical power system and comprising at least one monitoring device according to any one of the claims 39 to 53 to monitor at least one electrical apparatus comprising electromagnetic receiving means.